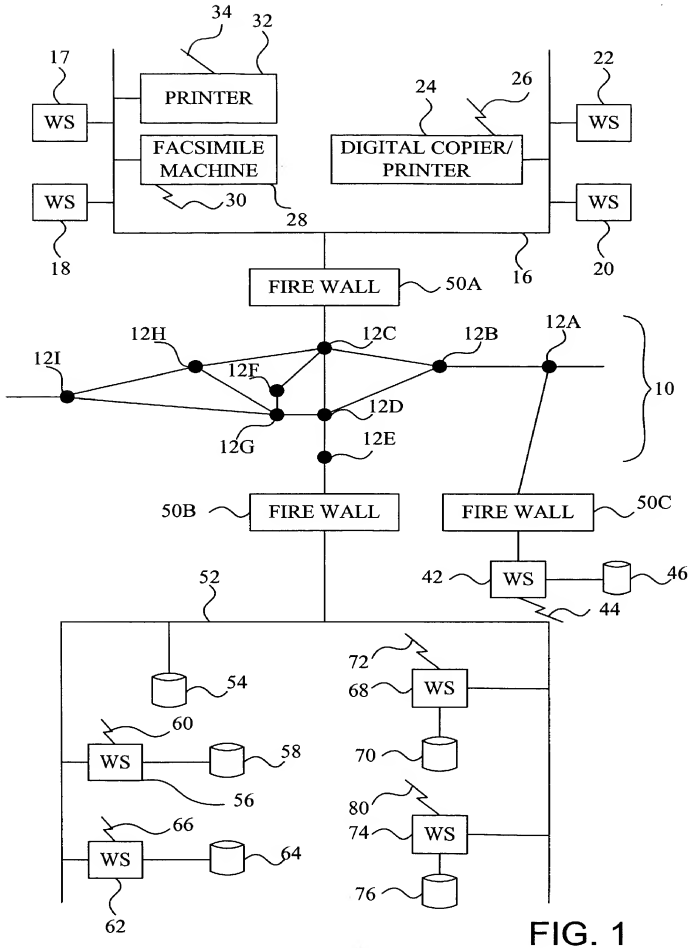
34
32
17
PRINTER
22
24
26
WS
FACSIMILE MACHINE
DIGITAL COPIER/ PRINTER
WS
WS
30
28
WS
18
16
20
FIRE WALL
50A
12H
12C
12B
12A
12I
12F
10
12D
12G
12E
50B
FIRE WALL
FIRE WALL
50C
52
42
WS
46
44
72
54
68
WS
60
WS
58
70
56
80
66
74
WS
WS
64
76
62

FIG. 1

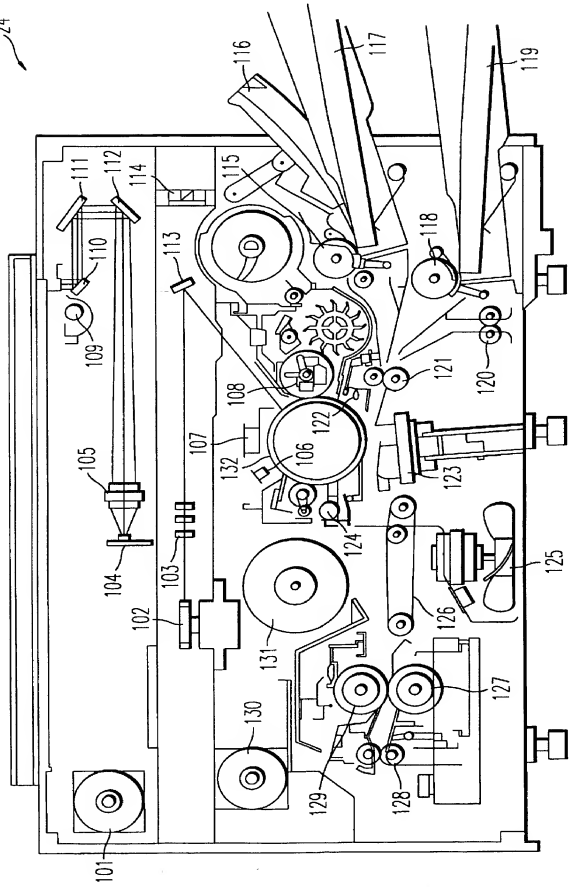
24
101
102
103
104
105
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132

FIG. 2

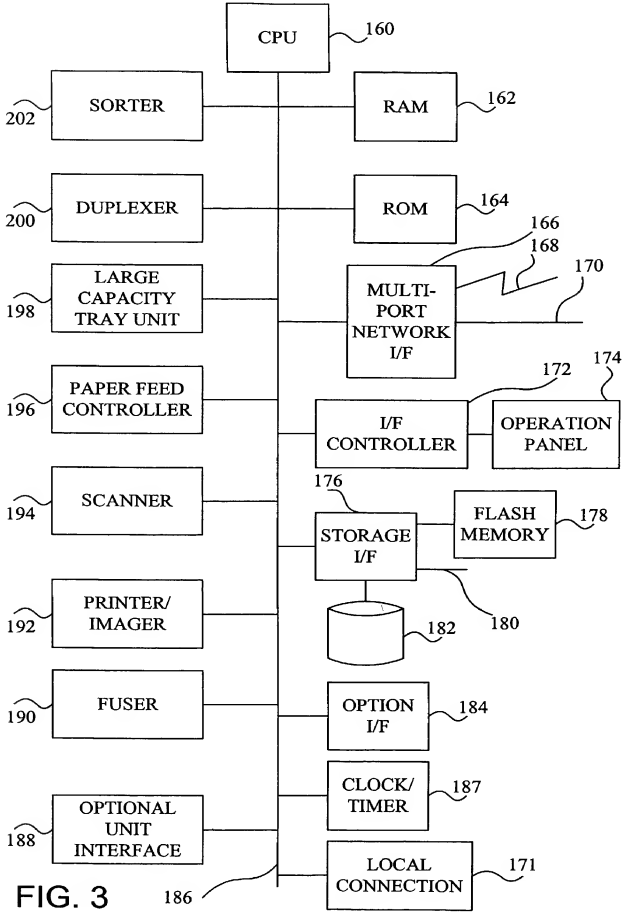
CPU
160
SORTER
202
RAM
162
DUPLEXER
200
ROM
164
166
168
170
LARGE CAPACITY TRAY UNIT
198
MULTI-PORT NETWORK I/F
PAPER FEED CONTROLLER
196
172
174
I/F CONTROLLER
OPERATION PANEL
176
SCANNER
194
FLASH MEMORY
178
STORAGE I/F
PRINTER/ IMAGER
192
182
180
FUSER
190
OPTION I/F
184
CLOCK/ TIMER
187
OPTIONAL UNIT INTERFACE
188
LOCAL CONNECTION
171
186

FIG. 3

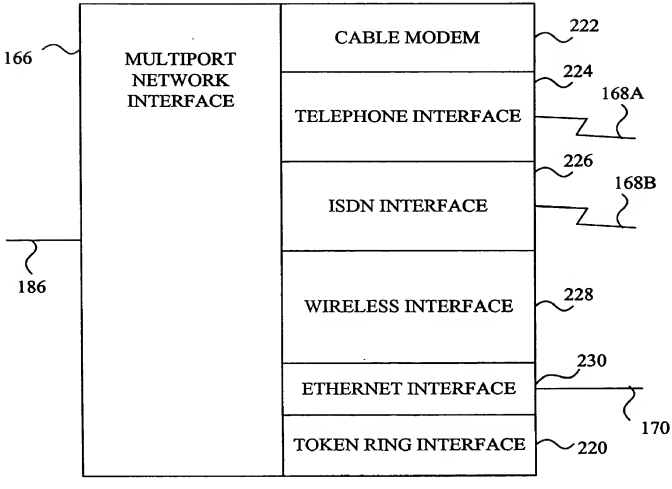
166
MULTIPORT NETWORK INTERFACE
186
CABLE MODEM
222
TELEPHONE INTERFACE
224
168A
ISDN INTERFACE
226
168B
WIRELESS INTERFACE
228
ETHERNET INTERFACE
230
170
TOKEN RING INTERFACE
220

FIG. 4

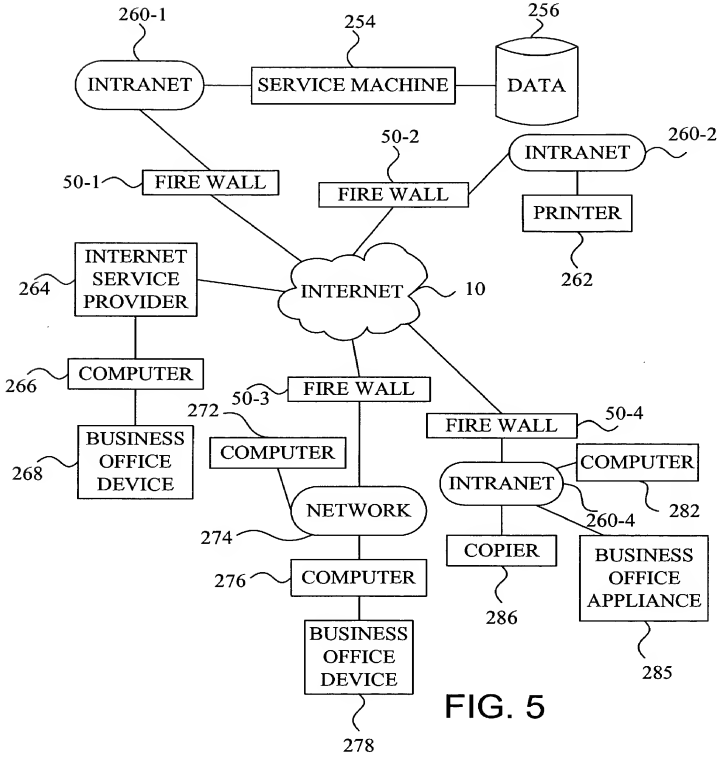
260-1
254
256
INTRANET
SERVICE MACHINE
DATA
50-2
260-2
INTRANET
50-1
FIRE WALL
FIRE WALL
PRINTER
INTERNET SERVICE PROVIDER
264
INTERNET
10
262
COMPUTER
266
FIRE WALL
50-3
272
FIRE WALL
50-4
BUSINESS OFFICE DEVICE
268
COMPUTER
COMPUTER
INTRANET
NETWORK
282
260-4
274
COPIER
BUSINESS OFFICE APPLIANCE
276
COMPUTER
286
BUSINESS OFFICE DEVICE
285
278

FIG. 5

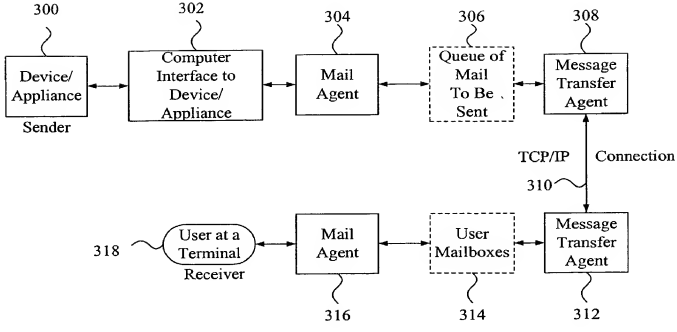
300
302
304
306
308
Device/ Appliance
Sender
Computer Interface to Device/ Appliance
Mail Agent
Queue of Mail To Be Sent
Message Transfer Agent
TCP/IP
Connection
310
318
User at a Terminal
Receiver
Mail Agent
User Mailboxes
Message Transfer Agent
316
314
312

FIG. 6A

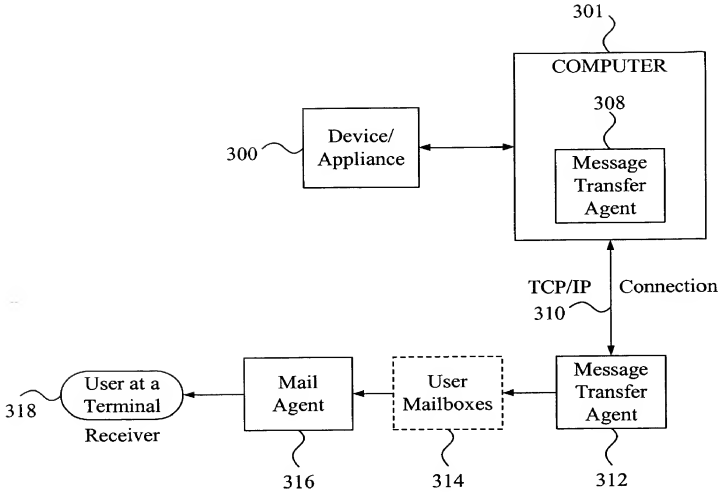
301
COMPUTER
308
Message Transfer Agent
300
Device/ Appliance
TCP/IP Connection
310
Message Transfer Agent
User Mailboxes
Mail Agent
User at a Terminal
318
Receiver
316
314
312

FIG. 6B

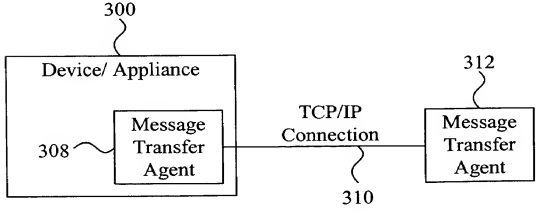
300
Device/ Appliance
308
Message Transfer Agent
TCP/IP Connection
310
312
Message Transfer Agent

FIG. 6C

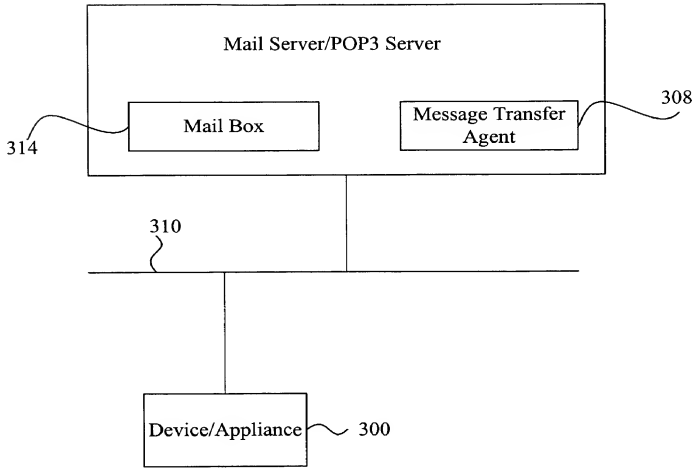
Mail Server/POP3 Server
Mail Box
Message Transfer Agent
308
314
310
Device/Appliance
300

Fig. 6D

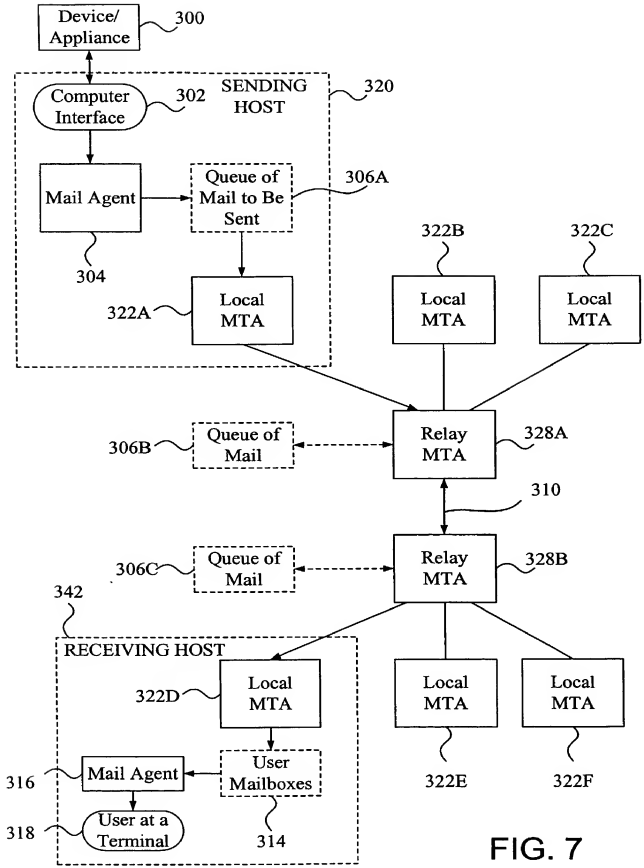
Device/ Appliance
300
Computer Interface
302
SENDING HOST
320
Mail Agent
304
Queue of Mail to Be Sent
306A
322A
Local MTA
322B
Local MTA
322C
Local MTA
306B
Queue of Mail
Relay MTA
328A
310
306C
Queue of Mail
Relay MTA
328B
342
RECEIVING HOST
322D
Local MTA
Local MTA
Local MTA
322E
322F
316
Mail Agent
User Mailboxes
318
User at a Terminal
314

FIG. 7

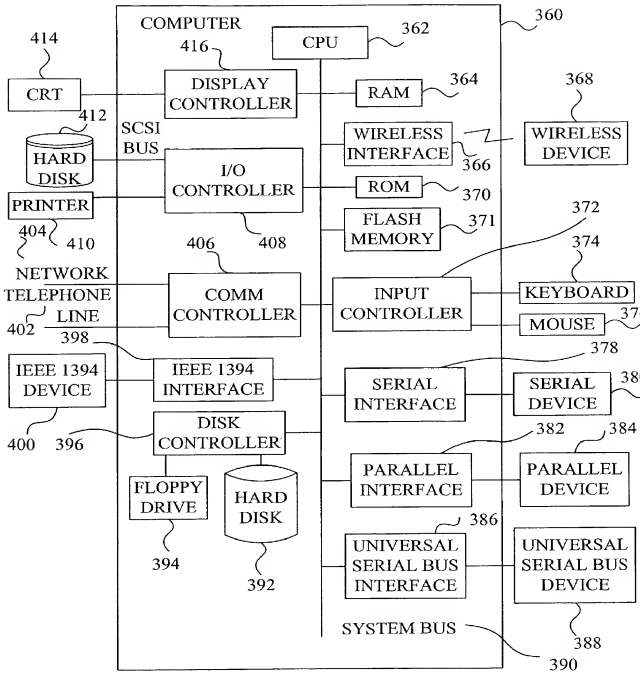
COMPUTER
360
CPU
362
414
416
CRT
DISPLAY CONTROLLER
RAM
364
368
412
SCSI BUS
WIRELESS INTERFACE
366
WIRELESS DEVICE
HARD DISK
I/O CONTROLLER
ROM
370
PRINTER
FLASH MEMORY
371
372
404
410
406
408
374
NETWORK
TELEPHONE LINE
402
COMM CONTROLLER
INPUT CONTROLLER
KEYBOARD
MOUSE
376
398
378
IEEE 1394 DEVICE
IEEE 1394 INTERFACE
SERIAL INTERFACE
SERIAL DEVICE
380
400
396
DISK CONTROLLER
382
384
PARALLEL INTERFACE
PARALLEL DEVICE
FLOPPY DRIVE
HARD DISK
386
UNIVERSAL SERIAL BUS INTERFACE
UNIVERSAL SERIAL BUS DEVICE
394
392
SYSTEM BUS
388
390

FIG. 8

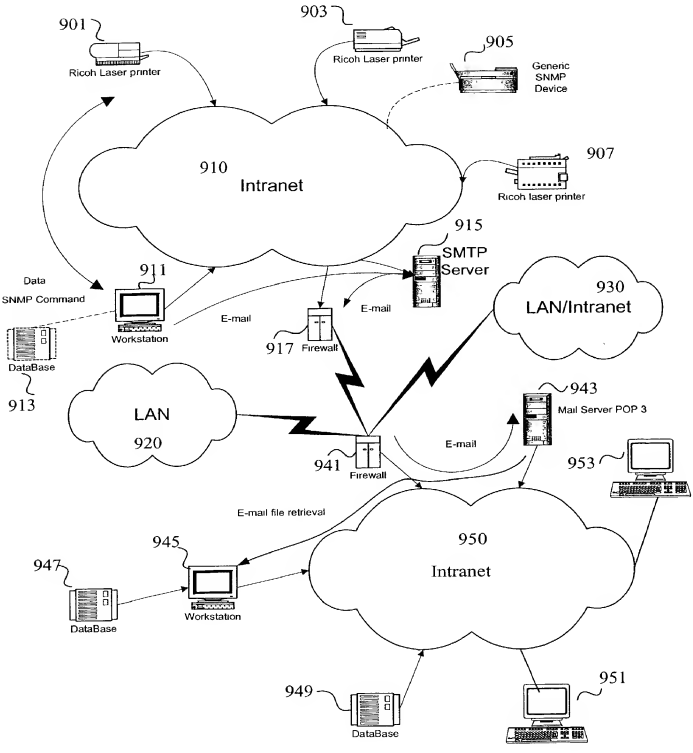
901
Ricoh Laser printer
903
Ricoh Laser printer
905
Generic SNMP Device
910
Intranet
907
Ricoh laser printer
915
SMTP Server
911
Data
SNMP Command
Workstation
E-mail
E-mail
917 Firewall
930
LAN/Intranet
DataBase
913
LAN
920
943
Mail Server POP 3
941
Firewall
E-mail
953
E-mail file retrieval
945
947
950
Intranet
DataBase
Workstation
949
DataBase
951

Figure 9

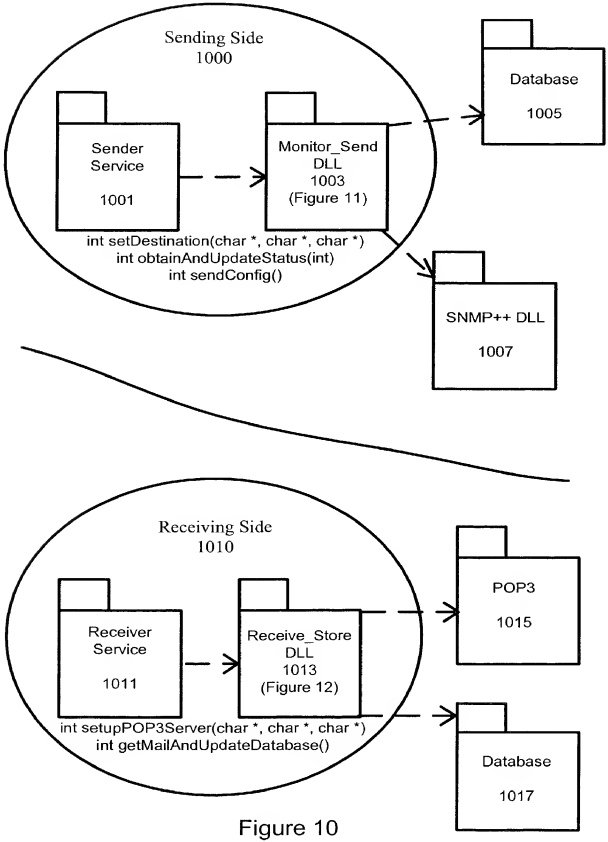
Sending Side
1000
Sender Service
1001
Monitor_Send DLL
1003
(Figure 11)
Database
1005
SNMP++ DLL
1007
int setDestination(char *, char *, char *)
int obtainAndUpdateStatus(int)
int sendConfig()
Receiving Side
1010
Receiver Service
1011
Receive_Store DLL
1013
(Figure 12)
POP3
1015
Database
1017
int setupPOP3Server(char *, char *, char *)
int getMailAndUpdateDatabase()

Figure 10

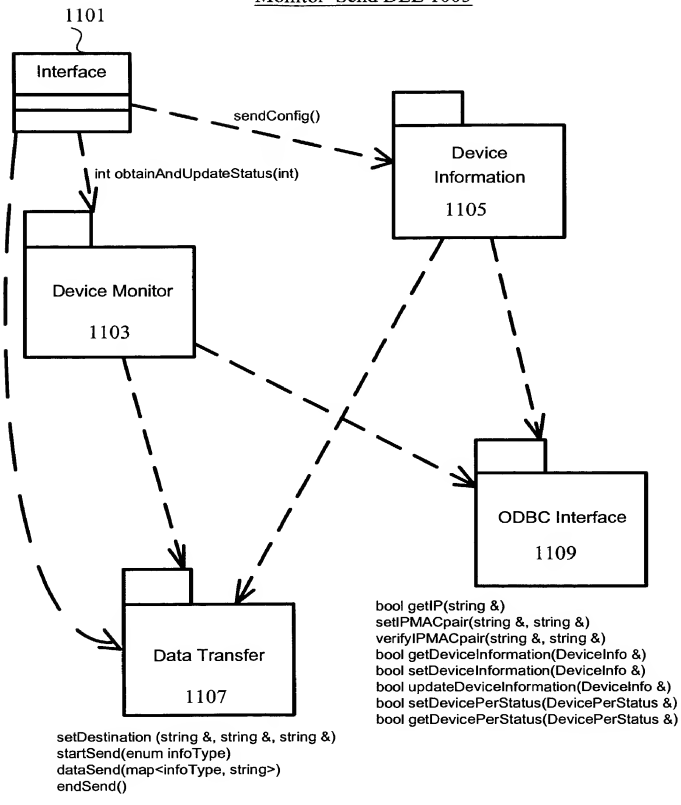
Monitor Send DLL 1003
1101
Interface
sendConfig()
int obtainAndUpdateStatus(int)
Device Information
1105
Device Monitor
1103
ODBC Interface
1109
Data Transfer
1107
bool getIP(string &)
setIPMACpair(string &, string &)
verifyIPMACpair(string &, string &)
bool getDeviceInformation(DeviceInfo &)
bool setDeviceInformation(DeviceInfo &)
bool updateDeviceInformation(DeviceInfo &)
bool setDevicePerStatus(DevicePerStatus &)
bool getDevicePerStatus(DevicePerStatus &)
setDestination (string &, string &, string &)
startSend(enum infoType)
dataSend(map<infoType, string>)
endSend()

Figure 11

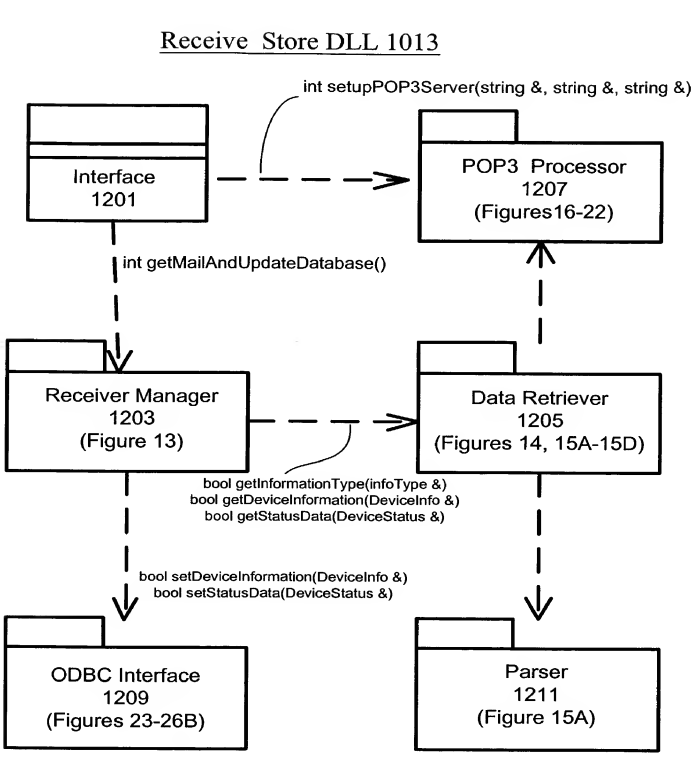
Receive Store DLL 1013
int setupPOP3Server(string &, string &, string &)
Interface
1201
POP3 Processor
1207
(Figures16-22)
int getMailAndUpdateDatabase()
Receiver Manager
1203
(Figure 13)
Data Retriever
1205
(Figures 14, 15A-15D)
bool getInformationType(infoType &)
bool getDeviceInformation(DeviceInfo &)
bool getStatusData(DeviceStatus &)
bool setDeviceInformation(DeviceInfo &)
bool setStatusData(DeviceStatus &)
ODBC Interface
1209
(Figures 23-26B)
Parser
1211
(Figure 15A)

Figure 12

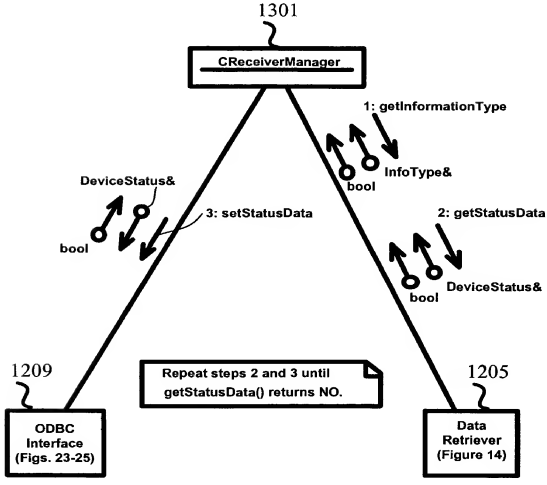
Receiver Manager 1203
1301
CReceiverManager
1: getInformationType
InfoType&
bool
DeviceStatus&
bool
3: setStatusData
2: getStatusData
bool
DeviceStatus&
1209
Repeat steps 2 and 3 until
getStatusData() returns NO.
1205
ODBC
Interface
(Figs. 23-25)
Data
Retriever
(Figure 14)

Figure 13

Data Retriever 1205

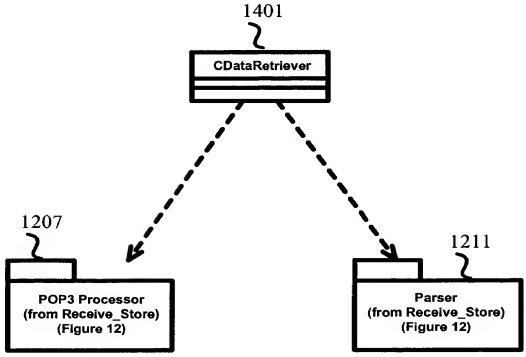

Figure 14

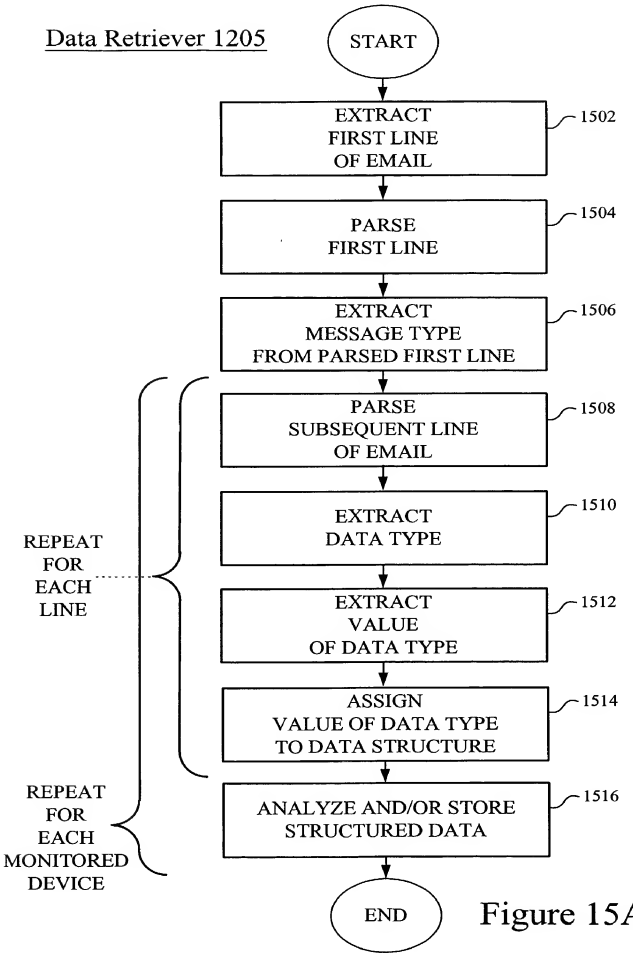
Data Retriever 1205
START
EXTRACT FIRST LINE OF EMAIL
1502
PARSE FIRST LINE
1504
EXTRACT MESSAGE TYPE FROM PARSED FIRST LINE
1506
PARSE SUBSEQUENT LINE OF EMAIL
1508
EXTRACT DATA TYPE
1510
EXTRACT VALUE OF DATA TYPE
1512
ASSIGN VALUE OF DATA TYPE TO DATA STRUCTURE
1514
ANALYZE AND/OR STORE STRUCTURED DATA
1516
REPEAT FOR EACH LINE
REPEAT FOR EACH MONITORED DEVICE
END

Figure 15A

Data Retriever 1205

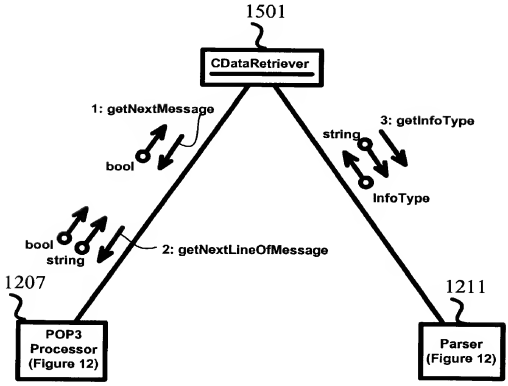

Figure 15B

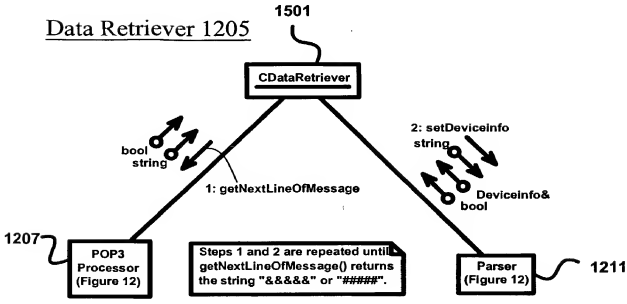

Figure 15C

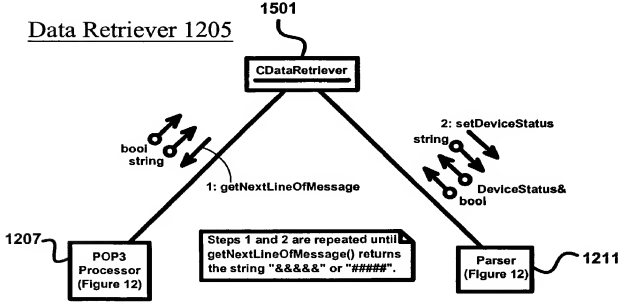

Figure 15D

POP3 Processor 1207

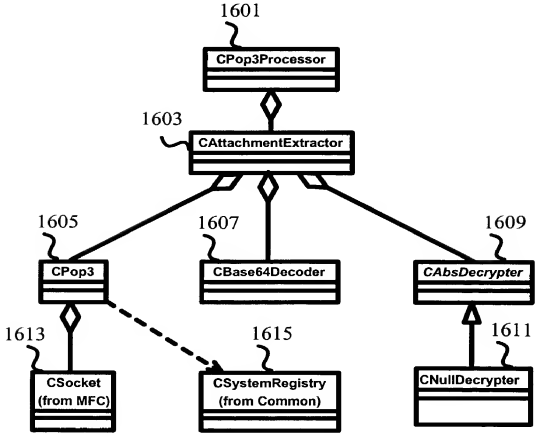

Figure 16

POP3 Processor 1207

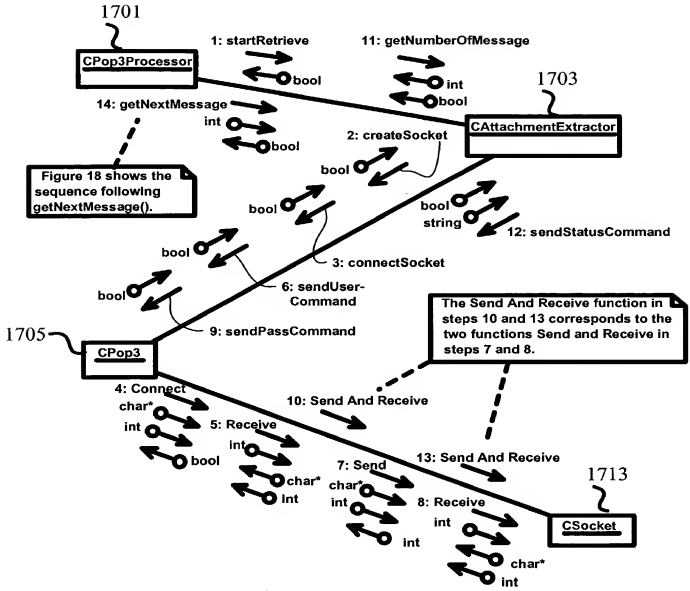

Figure 17

POP3 Processor 1207

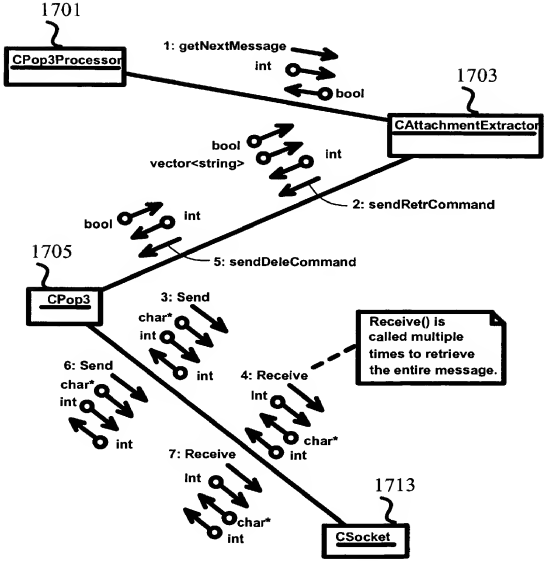

Figure 18

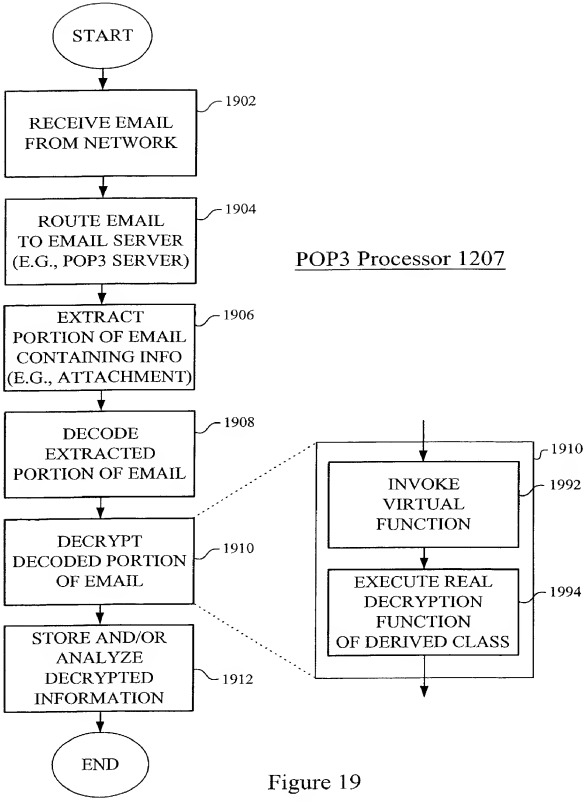
START
RECEIVE EMAIL FROM NETWORK
1902
ROUTE EMAIL TO EMAIL SERVER (E.G., POP3 SERVER)
1904
POP3 Processor 1207
EXTRACT PORTION OF EMAIL CONTAINING INFO (E.G., ATTACHMENT)
1906
DECODE EXTRACTED PORTION OF EMAIL
1908
DECRYPT DECODED PORTION OF EMAIL
1910
STORE AND/OR ANALYZE DECRYPTED INFORMATION
1912
END
1910
INVOKE VIRTUAL FUNCTION
1992
EXECUTE REAL DECRYPTION FUNCTION OF DERIVED CLASS
1994

Figure 19

POP3 Processor 1207

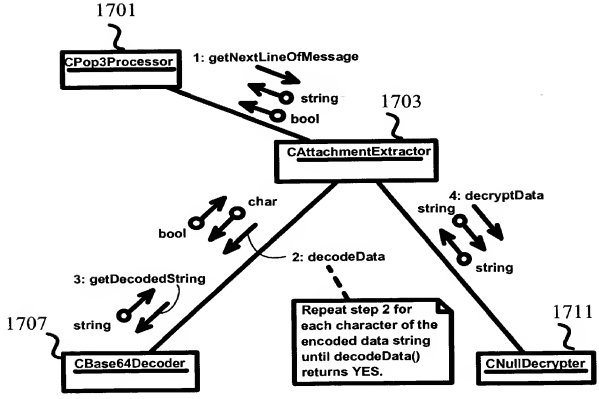

Figure 20A

POP3 Processor 1207

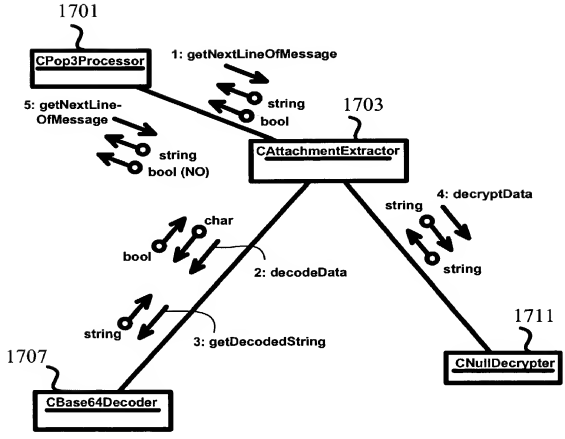

Figure 20B

POP3 Processor 1207

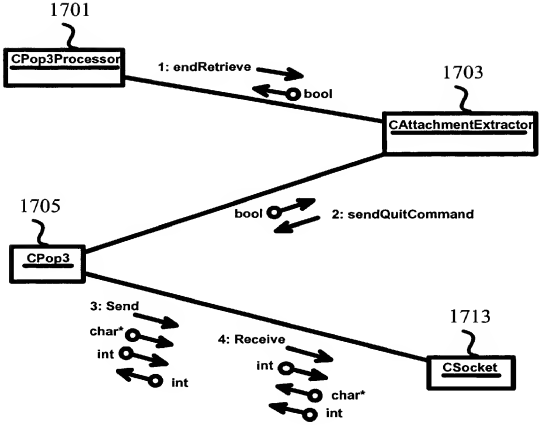

Figure 21

POP3 Processor 1207

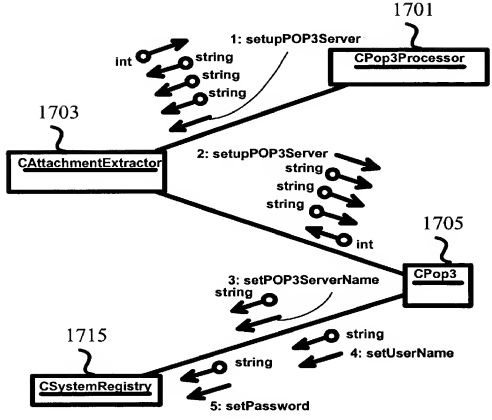

Figure 22

ODBC Interface 1209

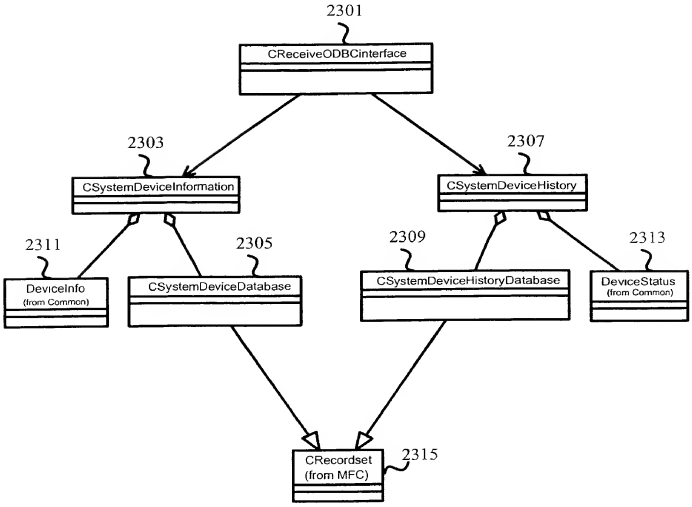

Figure 23

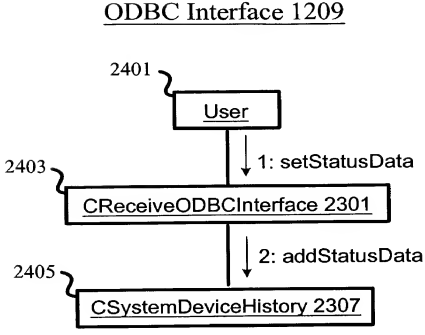

Figure 24

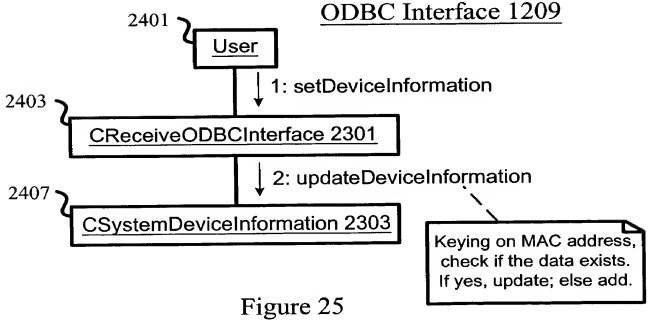

Figure 25

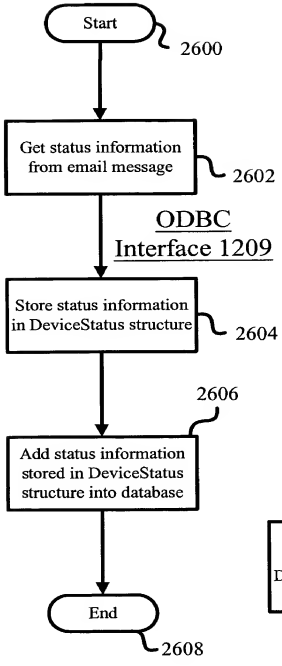

Figure 26A

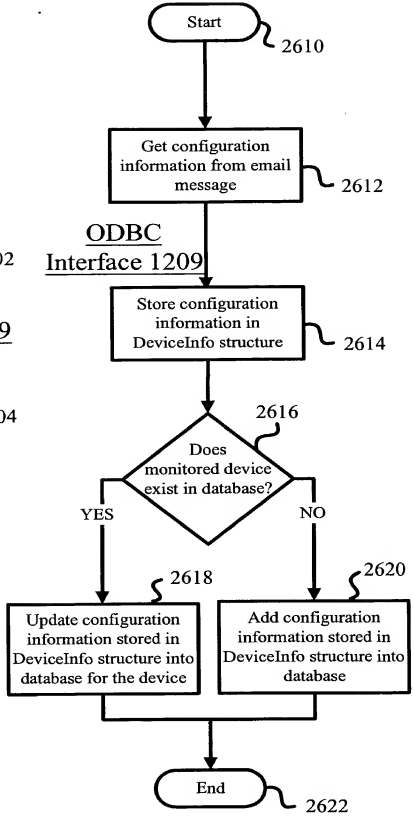

Figure 26B